Seepage and Conveyance Technical Feedback Group
Thursday, September 13, 2012, 8:00 – 11:00 a.m.
San Luis Canal Company
11704 Henry Miller Avenue, Dos Palos, CA
Draft Meeting Notes

Attendees

Shelly Abajian	Office of Senator Dianne Feinstein
Steve Chedester	San Joaquin River Exchange Contractors
Ron Cunha	Nickel Family LLC/San Juan Ranch
Jason Gurdak	Peer Reviewer
Richard Harmon	Landowner
Katrina Harrison	Bureau of Reclamation
Steven Haugen	Kings River Water Association
Brian Heywood	CDM Smith
Reggie Hill	Lower San Joaquin Levee District
Randy Houk	Columbia Canal District (CCC)
Chase Hurley	San Luis Canal Company (SLCC)
Anusha Kashyap	CDM Smith
Joel Kimmelshue	Peer Reviewer
Stephen Lee	Bureau of Reclamation
Katie Lichty	Circlepoint
Clifton Lollar	Kings River Water Association
Bill Luce	Friant Water Authority
Rod Meade	Restoration Administrator
Dan Munk	Peer Reviewer
Nigel Quinn	Peer Reviewer
Patti Ransdell	Circlepoint
Steve Phillips	U.S. Geological Survey (USGS)
Mark Roberson	Peer Reviewer
Paul Romero	DWR
Dan Royer	Wolfsen, Inc
Al Steele	Peer Reviewer
Brent Stearns	Nickel Family LLC/San Juan Ranch
Stuart Styles (phone)	Peer Reviewer
Mark Tompkins	SJRRP Technical Advisory Committee (TAC)
Jon Traum	U.S. Geological Survey (USGS)
Peter Vorster	The Bay Institute
Chris White	Central California Irrigation District (CCID)
Beth Wrege (phone)	National Oceanic and Atmospheric Administration (NOAA)

Introductions, Meeting Objectives and Agenda

Patti Ransdell, facilitator, opened the Seepage and Conveyance Technical Feedback Group (SCTFG) meeting with introductions and defined the purpose of the meeting which was to kick off the independent review of the Seepage Management Plan (SMP) that has been developed over the last year and a half. This meeting is an opportunity for the independent peer review panel to hear stakeholder's concerns on the SMP and learn more about the San Joaquin River Restoration Program (SJRRP).

SJRRP Overview

Katrina Harrison gave an overview of the SJRRP for the peer review panel.

- *Question: Where are SJRRP flows released from?* The flows are released from Friant Dam.
- *Question: Were there a series of hydrographs and loss assumptions used for various reaches? Are there flow targets at various points along the river?* It was clarified that the control point is from Friant but there are monitoring locations along the river to confirm flows. There are other locations along the river (e.g., Mendota Pool) where flow can be regulated.

Katrina explained that Interim flows are meant as testing and will guide decisions for moving forward to full Restoration flows.

The purpose of the peer reviewers is to independently check the SMP. The SMP will be revised based on the reviewers' feedback.

- *Question: Will the peer reviewers be reviewing seepage remedies and suggesting new ones?* Yes, they will review seepage remedies as detailed in the SMP. The purpose of the review is to evaluate SMP in totality, including operations, Interim/Restoration flow releases, setting thresholds, etc. The reviewers were provided with a specific list of questions that need to be answered as part of the review process.
- *Question: What is the schedule for the peer review panel to review the SMP?* The peer review panel will review the document over the next six weeks and produce a report by the end of October. The peer reviewers will come back to the SCTFG to make a presentation on their findings and recommendations.

Stakeholder Perspective (Out of Order from Agenda)

Due to schedule conflicts, Chris White and Chase Hurley gave their stakeholder perspective to the peer reviewers at this point in the meeting.

Chase gave an overview of the perspective of managers of local districts, farmers, and landowners. He said that Reclamation took time to do lots of field work and work with landowners to see what thresholds the landowners were comfortable with. Chase explained how this process has been long but has been working. Chase expressed the desire to be proactive in working with Reclamation to develop a plan and making sure the SJRRP proceeds in a way that does not impact landowners' farming operations.

Chase gave the group a handout with an excerpt from the SMP Appendix H (Thresholds). He discussed crop root depths in relation to groundwater level and how it is affected by flow types as explained in the SMP. He also pointed out that the data in Table H-1 had been developed by Reclamation and been vetted by the landowners/irrigation districts. He mentioned that while the landowners were comfortable with the numbers used in Table H-1, they were concerned that those numbers would not be useful if landowners decided to switch cropping patterns or switch to permanent crops. Chase thinks that Table H-1 is a good starting point to move forward, but still has some concerns about permanent crops.

Chase discussed crop salt tolerance level on various cropping rotations as it relates to groundwater seepage. One landowner experienced the salt balance going up with Interim Flows. He gave an example of a tile line that was installed and said that lots of crop salt tolerance mitigation worked both conceptually and in terms of what was seen in the field. Lines installed further out in the field have lower water quality that approaches salinity thresholds for reuse. Closer to the river, the interceptor lines pick up better water quality discharge.

Chase said Reclamation was willing to work with them on potential solutions to get groundwater levels where water can be moved down river.

Chris White talked about capillary rise and how that affects the root zone. He wants to hear what the peer reviewers think is a potential solution.

Chris shared that water surfaces in the river are higher than the adjacent fields. There is a high infiltration rate from the river to the surrounding ground, especially when water is first added and it is trying to equalize. Part of the reason this is known is because of infiltration noticed during past flood seasons.

Chris discussed subsidence. A portion of the CCID service area is subsiding at about a foot per year.

- *Question: How is land subsidence affecting river level?* It is not known to be deforming the river's cross section; however, it has a large effect on other features such as canals. This is being seen in the canal system in terms of capacity issues. This capacity restriction reduces the volume of water available to be delivered for irrigation.
- *Question: How extensive are the geological surveys? How recent is the data?* The data is recent. There is information from 2008 and 2010. Sack Dam had subsided 0.62 feet over one year. Other data includes satellite radar and interferogram as means of precisely monitoring the ground surface.

Chris discussed a proposed seepage interceptor line along the river. He had CCID staff determine sites where power was available and potential interceptor lines could be placed. He proposed putting interceptor lines on both sides of the river along the entire alignment from Mendota pool through Reach 4A. CCID has experience installing interceptor lines for this purpose. He proposes 15-inch lines, which may be oversized, but would intercept a broader band of flows and cover up to 4,500 cubic feet per second (cfs).

- *Question: Where would the drainage water be pumped to?* Chris proposes three potential sites: 1) river, 2) conveyance canal right next to it that has demands most of the time, or 3) put it in a drain

(least preferred because he believes there is good water quality that can be achieved from these interceptor lines near the river).

Chris discussed a problem drainage area at Camp 13 where he installed an interceptor line. There was an issue with trying to lower the water surface in these fields. Some groundwater had readings indicating 20,000 electrical conductivity (EC), latent in selenium. CCID installed nine miles of tile lines, intercepting primarily canal water.

- *Question: Had CCID considered lining the canal?* Yes, CCID did line a 120-foot portion of the canal.

Seepage Management Plan

Katrina Harrison gave an overview of the SMP and asked for input. The objective of the SMP is to maximize flows while avoiding seepage impacts.

Katrina reviewed several key sections of the SMP:

Appendix A – Seepage Impacts
Katrina noted that the California Department of Water Resources (DWR) is looking into the levee stability issues.

Appendix B – Locations of Known Risks

- *Question: Where does the East Side Bypass (ESBP) fit into the reach designations?* The ESBP is considered part of Reach 4B, near Sand Slough Control Structure (SSCS), which is an area of concern for seepage because these groundwater levels are above their thresholds. No Interim or Restoration Flows were released below Sack Dam for all of 2012. In 2011, flows below Sack Dam were up to 80 cfs.
- *Question: What types of thresholds are used in the ESBP/SSCS area?* Monitoring well thresholds are used.
- *Question: If the thresholds have been exceeded for over a year, is it possible that something else is impacting groundwater levels?* Part of the process is establishing thresholds correctly and examining the cause and effect of factors. It was noted that the system may be "full" because of flood water going through it in 2011 or due to other sources of water such as irrigation.
- *Question: How did the hydrologic conditions of 2011 compare to 1998, which was an El Nino year?* The flood flow conditions in 2011 were for a much longer duration than in 1998.

Appendix E – Operations Conceptual Model
It was clarified that a one-to-one increase in river stage to groundwater level is assumed.

- *Question: Is this meeting the peer review panel's first introduction to the operations conceptual model?* The peer reviewers had an introduction phone call with Reclamation earlier this week wherein general SJRRP background was provided to the reviewers.

Appendix F – Monitoring Program
The peer reviewers were invited to access monitoring historic data from the SLCC, CCC, and CCID.

- *Question: What is the depth of the groundwater monitoring wells?* Monitoring wells are typically about 25 feet deep.
- *Question: Is data from existing wells outside of the SJRRP being used (e.g., DWR database)?* Data from CCID and SLCC wells have been included in reporting, and wells from the DWR database were used to determine historical groundwater thresholds.

Appendix H – Thresholds

A stakeholder noted that root zone is important as it affects crop limitations. River flows may need to be constrained based on the root zones of different crops.

- *Question: Which reaches of the river are considered gaining reaches?* Reach 4B is the main gaining reach. Reclamation has a project that will deal with the long-term seepage concerns in Reach 4B.

Appendix I – Triggers, Site Visits, and Responses

There was a discussion on flow bench evaluations, which are used to predict what ground water levels will be before flows are increased. Historical data is considered in the evaluations. A stakeholder noted that there is a lag time of three days between when the flows are released and when seepage problems occur.

Appendix K – Seepage Project Handbook

Katrina explained that the Seepage Project Handbook (SPH), which was developed to include the process of evaluating, recommending, and designing seepage remedies, has now been integrated into the SMP as an appendix to the SMP.

- *Question: Have cropping patterns affected the priorities of properties for seepage projects?* When Reclamation does site evaluations, future plans to switch to permanent crops are evaluated, but it has not affected priorities.

There was a discussion regarding levee stability issues. DWR is working on data collection and guidelines for levee seepage. Paul Romero, DWR, provided the group with a brief update. Paul mentioned that DWR has determined potential levee stability impacts and are developing a drilling program to drill 75 miles of levee throughout the system and cover most of the highest priority levees. DWR plans to do the geotechnical investigation this fall and have evaluations next spring or summer to understand whether there are levee stability concerns needing repairs. DWR is talking with the FloodSafe program to extend evaluations to all levee reaches to potentially allow restoration flow at 4,500 cfs, and are trying to allocate funds to do these evaluations. There may be areas that need remediation projects.

The Restoration Administrator noted that based on levee criteria, flows are limited to 810 cfs, which sets the release at Friant Dam.

Katrina explained the five steps in the SPH (site evaluation, project report, financial assistance, design and bid, award, construction) and that each project would be built for 4,500 cfs of flows.

- *Question: How was the flow rate of 4,500 cfs determined when less water will be present as you move downstream?* The 4,500 cfs was stated in the Settlement.
- *Question: Is the flow rate of 4,500 cfs just related to flood flows?* No, it is the Restoration Flow.

Stakeholder Perspective

Bill Luce presented his stakeholder perspective to the group. He expressed support for third party protections through the SMP and trying to keep seepage impacts from landowners.

Bill discussed unexpected seepage losses in accordance with the settlement. The Settlement assumed a seepage loss in Reach 2, but not in Reaches 3 or 4A. Bill stated that Reclamation would have to purchase or acquire water to abide by the flow requirements of the Settlement. The Settlement has a water management goal which is to reduce water supply impacts to river. Once restoration flows get past the confluence, they can be returned to Friant through transfers that are supposed to occur. Bill stated that, from Friant's perspective, any water taken out of the river that was not expected (i.e., seepage to groundwater) has to be replaced.

- *Question: Where will the water from seepage projects be discharged?* A final decision has not been reached. The SJRRP will work with the landowners and the Regional Board on this issue.
- *Question: Has the water quality component of seepage project water been considered?* Bill said that quality is a nonissue for Friant Water Authority as it would be addressed through another agency such as the Regional Quality Control Board. Water cannot be recaptured until it gets past the Merced River.

Peter Vorster, The Bay Institute, presented his stakeholder perspective to the group. He expressed the desire to help Reclamation come up with an expeditious and cost efficient way to get water in the river. He believes the dry river is an unacceptable violation of state law.

Peter identified a challenge with distinguishing seepage issues caused by Restorations flows vs. natural and agricultural flows. He emphasized the importance of understanding conditions before the SJRRP. Peter expressed interest in working with the peer reviewers to help them understand the hydrology and Restoration flow operations.

A stakeholder commented that there has been a lot of observational data collected and lots of modeling has gone on, but it is unclear what questions are being asked of some of these models to understand what is going on. This led to further discussion on models. Katrina stated that several models are being used by the SJRRP. These models include:

- Hydraulic models of the river flow/stage relationships,
- Reservoir operations models,
- Temperature and habitat models, and
- Groundwater models.

The RiverWare model is a daily flow model used to estimate the routing of flows. This model is being used to supply input flow rates to the SJRRP groundwater model (SJRRPGW) to assist in estimating the extent of groundwater seepage from the river/bypass system.

The floodplain habitat evaluation is still being finalized.

- *Question: Is a groundwater model being used to predict groundwater levels?* Right now the SJRRP is using a 1:1 relationship based on the 1D hydraulic modeling water surface stage increase in Flow Bench Evaluations.
- *Question: Will there be analysis of groundwater table gradients to help identify which flows may result in threshold exceedances?* That work (using the SJRRPGW) is planned, but not yet underway. The lateral extent of seepage impacts from the river needs to be determined and the gradient for flow bench evaluations still need to be refined.
- *Question: Will the models be used to predict impacts to groundwater into the future?* This is the intent of the modeling. Groundwater levels will be predicted using multiple types of hydrologic conditions.
- *Question: Does the Settlement include habitat improvements?* Two specific projects in Reaches 2B and 4B have been identified that will address habitat needs in relation to fish population targets.

A stakeholder stated that cost efficient ways of completing the project may not be as important as accomplishing the flows mandated in the Settlement.

- *Question: Has climate change been considered in the SMP?* It is not currently in the SMP, but could be added.
- *Question: What questions are the peer reviewers going to answer*? The peer reviewers will answer the questions that were developed by Reclamation, with feedback from the SCTFG. If they want to provide other input, it is welcomed but not required.

The peer reviewers were invited to contact the stakeholders for any question or to get more information. They were also requested to write up brief call logs from these conversations to ensure that all reviewers have the same information available.

Conclusions and Next Steps

Katrina reviewed the objective of the SMP and the peer review panel. The peer reviewer report is due by October 31, 2012 followed by a findings presentation. Hopefully all reviewers can attend a technical feedback group meeting to present their findings. The goal is to have a revised SMP for the Spring 2013 pulse flows.

The peer reviewers will organize themselves to get to know each other etc., and Brian Heywood will facilitate as possible. It was noted that one peer reviewer, Stuart Styles, was not able to attend the SCTFG meeting.

Comments on the SMP were also solicited from the SCTFG. Responses from the SCTFG are due to Brian Heywood by **October 12, 2012.** This feedback from the group will be reviewed along with the peer review panel's recommendations.

The version of the SMP (the most recent version) that was passed out at today's meeting will be posted online.

- *Question: Which sections of the SMP were updated since the last version?* The updated appendices are: B, C, D, J and K. Katrina will send an overview of the updates along with the link to the updated online version.

Action item: Katrina will send an overview of what was updated in the SMP along with a link.

A stakeholder suggested that the SPH should be reordered on the website to be behind the SMP since it is now an appendix to the SMP.

Action item: Re-order the SMP and SPH on the website to coincide with what was provided to the Peer Reviewers.

Current Seepage Projects

Brian Heywood provided the group with an update on the current seepage projects underway. Brian reviewed how these parcels were prioritized.

Brian reviewed the priority parcel groups and gave an update on the status of each one.

- *Question: How far from the river were parcels looked at and how was this distance determined?* It was noted that some priority parcel appear to be far from the river because of the property boundaries but that the river may be affecting only a portion of the parcel.

The purpose of the Site Evaluation is to determine the problem. It determines the factors influencing seepage effects on the property and where they come from.

- *Question: Can the table listing number of projects required to achieve various flows be clarified?* The numbers of projects listed are based on Reclamation's current understanding and analysis.

In the future, collaboration with DWR will be necessary as they collect levee data and identify issues.

Action Items:

Action item: Katrina will send an overview of what was updated in the SMP along with a link.

Action item: Re-order the SMP and SPH on the website to coincide with what was provided to the Peer Reviewers.

Parking Lot Topics

- There are no new topics to add to the parking lot list

Site Tour

From 12:15 p.m. to 4:15 p.m., the peer review panel and members of the SCTFG who wanted to participate went on a site tour of San Juan Ranch (Jim Nickel's Property), the SSCS, and Sack Dam. Questions asked during the site tour by the participants were recorded.

San Juan Ranch

Jim Nickel explained to the group that he had installed interceptor drains in his property when he initially noticed seepage in 1998. Questions were posed to Jim and Chris White at this point.

- *Question: Would you consider what was done to mitigate seepage a proof of the concept?* Yes—it gives us an idea of how systems perform.
- *Question: Where was the drain?* One interceptor line was buried on the toe of levee, another was built farther away within the field.
- *Question: What quality of water intercepted?* In general, the water quality gets increasingly more saline towards the fields. In board line: interception of river water. Out board line: mixture river water and ground water.
- *Question: There was a question if it's possible to differentiate salts from the San Joaquin versus delta water?* Probably, but you would need a geochemist.
- *Question: When did the first drains go in?* 1998.
- *Question: What is the EC on pumps?* 1.88 and 2.44
- *Question: Does the water from seepage or the salinity cause more damage to the crops?* Salinity.
- *Question: Where do you put the water from the interceptor lines?* In the drain.
- *Question: How much power did you have to use?* About $10/mile.

Sand Slough Control Structure

Several questions were posed to Chris White while the group was at SSCS.

- *Question: How much capacity is there in the ESBP, if you took out the sand wedge in the ESBP?* 1,000 cfs
- *Question: Have you been working with regulatory agencies to resolve subsidence issue?* Yes.
- *Question: What is the plan for salmon routing in the Mariposa Bypass?* The Reach 4B project is examining flow and fish issues in that reach.
- *Question: What type of seepage project is envisioned for priority parcels?* Currently the priority parcels are in the site evaluation phase. The choice of seepage projects is not established yet. The current schedule is to implement seepage projects sometime in 2013.

Sack Dam

No questions were recorded at Sack Dam.